What is claimed is:

1. An intrinsically safe sensor signal processing circuit, comprising:

a sensor means to measure physical value in hazardous area;

a safety barrier means mounted in non-hazardous area or in an enclosure housing in hazardous area;

a plurality of current limiting resistors located inside of the safety barrier, connected in series with the sensor;

a first operational amplifier located inside of the safety barrier, as a driver of the sensor signal, coupling the current limiting resistors onto own output and inverting-input; and

a second operational amplifier located inside of the safety barrier, as a feeder of the sensor signal, coupling the current limiting resistors onto own output and inverting-input.

2. An intrinsically safe sensor signal processing circuit, comprising:
a sensor means to measure physical value in hazardous area;

a safety barrier means mounted in non-hazardous area or in an enclosure housing in hazardous area; and

a plurality of blocking capacitors for current limiting located inside of the safety barrier, connected in series with the sensor.

3. An intrinsically safe sensor signal processing circuit, comprising:

a sensor means to measure physical value in hazardous area;

a safety barrier means mounted in non-hazardous area or in an enclosure housing in hazardous area;

a plurality of blocking capacitors for current limiting located inside of the safety barrier, connected in series with the sensor;

a first operational amplifier located inside of the safety barrier, as a driver of the sensor signal, coupling the blocking capacitors onto own output and inverting-input; and

a second operational amplifier located inside of the safety barrier, as a feeder of the sensor signal, coupling the blocking capacitors onto own output and inverting-input.

4.The sensor signal processing circuit of claim 1, wherein a reference resistor exists between the feeding line directly from the sensor and the current limiting resistor coupled to the feeder's output in order to get the sensor signal as voltage value in a negative feedback schematic.

5. The sensor signal processing circuit of claim 3, wherein a reference resistor exists between the feeding line directly from the sensor and the blocking capacitor coupled to the feeder's output in order to get the sensor signal as voltage value in a negative feedback schematic.